PNNL technology designed to detect hidden weapons

A technology that is designed to rapidly identify hidden weapons, explosives and other contraband — even plastic, ceramic and other non-metallic weapons — through clothing is the cornerstone of a new company formed to commercialize the technology for a variety of security applications.

The technology, which uses millimeter waves to generate holographic images, was developed by the Department of Energy's Pacific Northwest National Laboratory for the Federal Aviation Administration to scan airline passengers as they pass through airport security checkpoints.

PNNL is operated for DOE by Battelle, which has licensed the technology to SafeView, Inc., a new corporation based in Menlo Park, Calif. Under terms of the licensing agreement, SafeView will establish and maintain a product development office in the Tri-Cities.

The holographic imaging system developed at Pacific Northwest National Laboratory detects all threats or contraband, including metal, plastic, liquids, drugs, and ceramic weapons, hidden under clothing.

The holographic imaging system is distinctly different from current surveillance systems that rely on metal detectors, X-ray imaging and, in some cases, strip searches. Metal detectors cannot screen for plastic or ceramic weapons, plastic explosives or other non-metallic contraband, while X-ray imaging subjects people to potentially harmful ionizing radiation.

"We believe that the imaging system has enormous potential for use in screening people at points of entry to mass transit systems including airports, subways and trains; border crossings; government installations such as courtrooms, military bases, prisons, embassies and office buildings; crowded public places such as sports arenas, concert halls and museums; and commercial buildings," said Mike Lyons, chairman of SafeView's board of directors.

"While the technology was developed to identify dangerous objects or contraband that people might bring into a facility, we believe it also could be used to protect against theft by identifying concealed items that people might try to remove from facilities, ranging from museums to nuclear plants," added Doug McMakin, a PNNL engineer who was a principal developer of the technology.

Looking much like a conventional metal detector, the system projects ultrahigh-frequency, low-powered radio waves onto the front and back of the person being screened. These waves — known as millimeter or centimeter waves because they have wavelengths of about one centimeter — penetrate clothing and bounce off the person and the items he or she may be carrying.

A sensor array captures the reflected waves and sends the information to a high-speed image-processing computer. The computer analyzes the information and produces a high-resolution, three-dimensional image from the signals that allows an operator to screen for suspicious materials.

The security scanner has its roots in a three-dimensional holograph imagery technology program that was established at PNNL in the 1970s to develop non-destructive evaluation technologies for nuclear reactors. In the mid-1980s, the FAA became interested in the technology's potential for scanning people passing through airports and began funding research in 1989. ■